

## OmniHawk™ 4/16 Token Ring Fiber Converter

### User's Manual

## SAFETY CONSIDERATIONS

WARNING

The instructions in this User Manual are for use by qualified personnel only. To avoid electrical shock, do not perform any servicing of this unit or the power supply module, other than that contained in the operating instructions, unless you are qualified and certified to do so by **OST**.

### CAUTION

All user required operations may be performed without ever opening the unit. Never attempt to open or remove the cover or tamper with the power supply module.

## LINE VOLTAGE

Before connecting the power units to the line voltage, make sure that the voltage of the power source (wall outlet) matches the voltage specified on the power units.

## WARRANTY

This **OST** product is warranted to the original purchaser against defects in material and workmanship for a period of **TWO YEARS** from the date of shipment. A **LIFETIME** warranty may be obtained by the original purchaser by **REGISTERING** this product with **OST** within 90 days from the date of shipment. TO REGISTER, PLEASE COMPLETE AND MAIL OR FAX THE REGISTRATION CARD. During the warranty period, **OST** will, at its option, repair or replace products which prove to be defective.

For warranty service, the product must be sent to an **OST** designated repair facility, at Buyer's expense. **OST** will then pay the postage/shipping charges to return the product to Buyer (using **OST**'s standard shipping method).

## LIMITATIONS OF WARRANTY

The foregoing warranty shall not apply to defects resulting from improper or inadequate use and/or maintenance of the equipment by Buyer, Buyer-supplied equipment, Buyer-supplied interfacing, unauthorized modifications or tampering with equipment (including removal of equipment cover by personnel not specifically authorized and certified by **OST**), or misuse, or operation outside the environmental specification of the product (including but not limited to voltage, ambient temperature, radiation, unusual dust, etc.), or improper site preparation or maintenance.

No other warranty is expressed or implied, **OST** specifically disclaims the implied warranties of merchantability and fitness for any particular purpose.

## EXCLUSIVE REMEDIES

The remedies provided herein are the Buyer's sole and exclusive remedies. **OST** shall not be liable for any direct, indirect, special, incidental, or consequential damages, whether based on contract, tort, or any legal theory.

FCC WARNING

This equipment has been tested and found to comply with the limits for a class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide a reasonable protection against harmful interference when the equipment is operated in a commercial environment. The equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. Any changes or modifications not expressly approved by the manufacturer could void the user authority to operate the equipment.

## NOTES

[illegible]

## TECHNICAL SUPPORT

If you encounter any problems in installing or maintaining this equipment, do not hesitate to call, fax or write Omnitron's technical support:

**Omnitron Systems Technology, Inc.**  
**27 Mauchly, Suite 201**  
**Irvine, CA 92618**

**Phone: 714-250-6510**  
**Fax: 714-250-6514**

# OmniHawk™ 4/16 Token Ring

## Fiber Converter

### USER'S MANUAL

#### GENERAL DESCRIPTION

The OmniHawk™ 4/16 Token Ring fiber converter provides a solution to heterogeneous Token Ring media environments. Conversions between copper (CAT-5 or Type 1) and fiber optic interfaces are required in most modern Token Ring installations.

Fiber optic cabling is the media of choice for connecting separate buildings within a campus network. Even trunk connections between floors of a single building benefit from the advantages of fiber optic media. In heavy industrial settings, fiber optic media may provide the only reliable connectivity even when the distances traveled are short. Moreover, a growing number of workstation interface cards now feature fiber optic connection.

The OmniHawk™ is packaged for a wide variety of media conversion applications. It can be wall mounted, rack mounted, or attached directly to the DB9 connector of a workstation.

#### ALWAYS CONNECT

The OmniHawk™ is specifically designed with an intelligent connection algorithm which assures dependable communications. Whether it is attached to passive or active devices, the OmniHawk™ will always make a good connection. The fiber optic interface adheres to the IEEE 802.5j specification for fiber optic attachment.

## CONNECTORS, SWITCHES & INDICATORS

### CONNECTORS

The OmniHawk™ has three interface connectors: a fiber optic transmitter and receiver pair, an RJ45 jack, and a DB9 male connector.

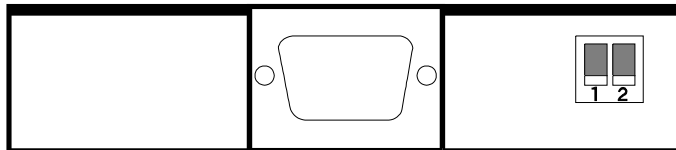
The DB9 connector and the chassis are designed to attach directly to the rear of a workstation network interface card. The jack screws ensure a solid connection.

The RJ45 connector is designed to attach directly to a hub lobe or ring out via a CAT-5 patch cable. The RJ45 connector may attach to a ring in with a crossed patch cable (transmit and receive pairs crossed).

Note that only one copper interface may be used at a time. Other connections are possible with special cables. Omnitron's technical support department can assist you with your special needs.

### SWITCHES

The OmniHawk™ has two switches which control the attachment mode. The switches are located to the right of the DB9 connector.



Both switches are placed in the UP position at the factory. The following table explains the switch settings.

ATTACHMENT MODE	SWITCH 1	SWITCH 2
Automatic Sensing	Up	Up
UTP/STP --> RO or Station	Up	Down
UTP/STP --> RI or Lobe	Down	Up
Self Test / Media Test	Down	Down

### CONNECTORS

In addition to the two switches there are four LED indicators in a 2 x 2 cluster. Refer to the drawing below.

## TECHNICAL SPECIFICATIONS

- Protocol: Token Ring (IEEE 802.5)
- Cables
  - Fiber Optic: Multi-mode glass fiber of sizes 50/125, 62.5/125, or 100/140 micron
  - STP: DB9 female
  - UTP: CAT-5 (EIA/TIA 568): (lower grade wiring at shorter distances)
- Data Rate: 16 Mbps or 4 Mbps
- Supported Distances
  - Fiber Optic: 2.5 Km multi-mode  
20 Km single-mode
  - UTP: 300 m
- Indicators
  - FO Ready: Yellow - Green LED
  - Cu Ready: Yellow - Green LED
  - Power/Error: Yellow - Red LED
  - Insert Status: Yellow - Green LED
- Dimensions: W: 3.46" x D: 2.83" x H: 0.78"
- Power: External Power Supply 9 VDC @ 1.2A
- Temperature
  - Operating: 0 to 45 degrees C
  - Storage: -40 to 75 degrees C
- Humidity: Up to 90% (non condensing)

### C. Hub Ring Out (RJ45) to distant hub Ring In (RJ45)

Application C shows the Ring Out of one hub connected to the Ring In of another hub via a pair of OmniHawk™ converters. Note that the cable from the second OmniHawk™ to the Ring In is a crossed cable.

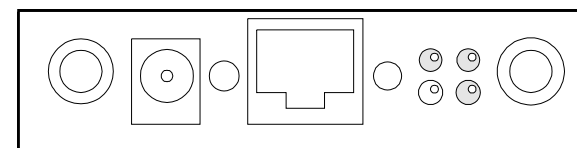
### D. Distant Lobe Extension

Application D shows a distant hub in lobe extension via a pair of OmniHawk™ converters. In this configuration a standard CAT-5 cable connects the extended hub to the first OmniHawk™, fiber optic cables connect the two converters, and another standard CAT-5 patch cable connects the second OmniHawk™ to the target hub.

### E. Other Applications

The above examples show the most common applications of the OmniHawk™. Your network may require an application not listed here. The configuration you need will be supported by the OmniHawk™ as long as the correct cable is used. The fiber optic cables will always be the same. The table below will guide you in selecting the proper copper cables, media filters, and connector adapters.

OST PART #	CONNECT FROM	CONNECT TO
9300-P45	OmniHawk™ RJ45	Lobe, RJ45
	OmniHawk™ RJ45	Ring Out, RJ45
9301-P45X	OmniHawk™ RJ45	Ring In, RJ45
	OmniHawk™ RJ45	Workstation, RJ45
5700-CMF & 9301-P45X	OmniHawk™ RJ45	Workstation, DB9(if not directly attaching the OmniHawk™ to the workstation)
5701-IP45 & 9300-P45	OmniHawk™ RJ45	Lobe, IBM Data Connector
	OmniHawk™ RJ45	Ring Out, IBM Data Connector
5701-IP45 & 9301-P45X	OmniHawk™ RJ45	Ring In, IBM Data Connector
9310-IF9	OmniHawk™ DB9	Ring In, IBM Data Connector
9311-IF9X	OmniHawk™ DB9	Ring Out, IBM Data Connector
	OmniHawk™ DB9	Lobe, IBM Data Connector
9320-FM9	OmniHawk™ DB9	Workstation, DB9(if not directly attaching the OmniHawk™ to the workstation)



The bottom left LED is yellow / red, the remaining three LEDs are yellow / green. The meaning of the LEDs are shown on the cover of the OmniHawk™ and in the tables below.

### POWER UP LED TEST

ALL LEDS	MEANING
Yellow for 1/2 second then Green or Red or 1/2 second	Self Test OK
Any other behavior	Failed Self Test, Call Technical Support

The OmniHawk™ performs a self test every time power is newly applied.

### OPERATIONAL MODES

FIBER READY (top left)	MEANING
GREEN	Data received from fiber
Off	No data is being received from Fiber

COPPER READY (top right)	MEANING
GREEN	Data received from copper
OFF	No data is being received from copper

POWER / ERROR (bot. left)	MEANING
YELLOW	Power is on
RED	An attachment error occurred

INSERT STATUS (bot. right)	MEANING
GREEN	The fiber optic and copper interfaces have both actively inserted
FLASHING GREEN	Still attempting to insert
OFF	Insertion is not being attempted

The operational modes are:

1. AUTOMATIC SENSING
2. UTP/STP → RO or STATION
3. UTP/STP → RI or LOBE

The power / error LED turns red when an attachment error occurs. An error can only occur when attaching to active devices (devices which signal for insertion with phantom current or the fiber optic key). The error condition occurs when copper device initiates the phantom current and the fiber optic device initiates the fiber optic key. In Token Ring, the active insertion process may only be directed from one direction.

## SELF TEST / MEDIA TEST MODE

FIBER READY (top left)	MEANING
GREEN	Data received from fiber
OFF	No data is being received from fiber

COPPER READY (top right)	MEANING
GREEN	Data received from copper
OFF	No data is being received from copper

POWER / ERROR (bot. left)	MEANING
YELLOW	Power is on

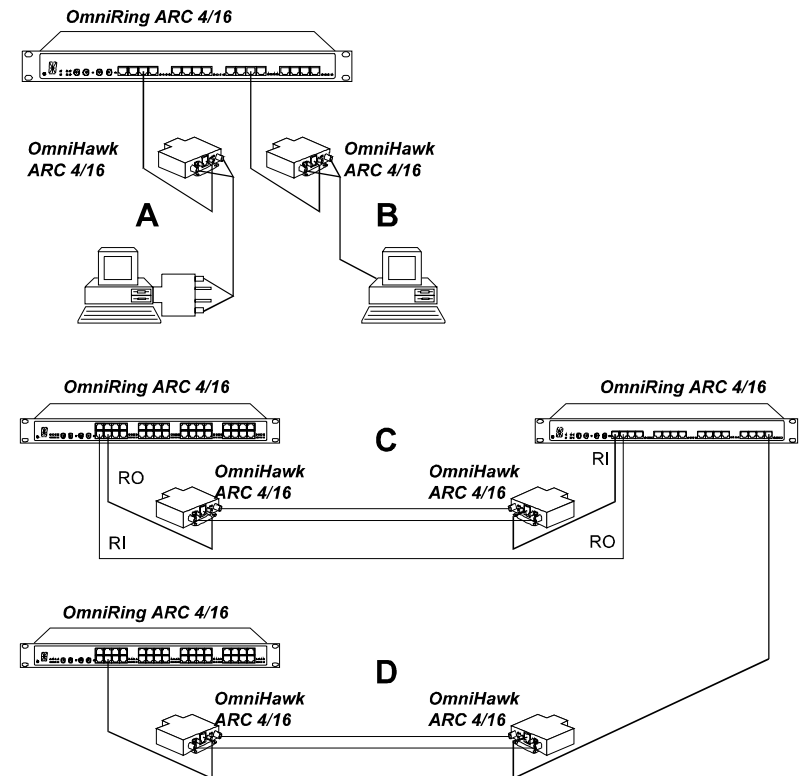
INSERT STATUS (bot. right)	MEANING
YELLOW	The OmniHawk™ is in the self test / media test mode.

## DIAGNOSTIC FEATURES

The OmniHawk™ diagnostic features make it easy to install and maintain. There are four levels of diagnostics: Power-On LED Test, Self Test / Media Test, Installation Test, and run-time ready and error monitoring.

## APPLICATIONS

The following drawing illustrates three different applications of the OmniHawk™.

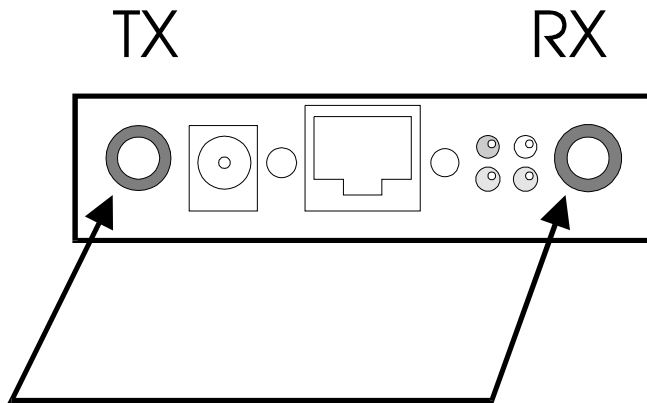


### A. STP Workstation (DB9) to distant hub (RJ45)

Application A shows an STP workstation connecting via its DB9 connector directly to one OmniHawk™, which is connected to a second OmniHawk™ via fiber optic cables. The last connection to the hub is made via a standard CAT-5 patch cable.

### B. Fiber optic Workstation to hub (RJ45)

Application B shows a fiber optic workstation connecting to an OmniHawk™ via its fiber optic cables. The OmniHawk™ connects to the hub via a standard CAT-5 patch cable.



To test the integrity of copper patch cables and any intervening baluns connect the OmniHawk™ to an unused lobe of any powered hub. If the cable is unbroken, the copper ready LED will light green. If the cable is broken, the LED will be off.

Note that the power / error LED and the test mode LED will both be yellow.

**NOTE: TURN OFF THE SELF TEST / MEDIA TEST MODE TO RETURN TO NORMAL OPERATIONAL MODES.**

## POWER-ON LED TEST

Every time power is newly applied to the OmniHawk™ the LEDs will flash through all possible colors to give the user the assurance that other diagnostic information may be correctly interpreted. The LEDs will flash all yellow, then either green or red. After that, the LED test is over and the LEDs will illuminate according to the mode (as set by the switches) and the current media connections.

## SELF TEST / MEDIA TEST

The self test / media test ensures that the OmniHawk™ is fully operational. Testing occurs when the switches both set to the DOWN position. The bottom two LEDs will both illuminate yellow indicating that power is on and that the unit is in the test mode. The testing checks both the data passing capability of the OmniHawk™ and the physical continuity of the media. For both fiber optic and copper media test data is looped back to the OmniHawk™. When a looped back fiber cable is connected from the transmit (TX) to the receive (RX) fiber optic connectors, the fiber optic ready LED lights green. When a CAT-5 patch cable is connected from the OmniHawk™ to an unused lobe of a hub, the copper ready LED lights green. If good connections are made and the corresponding LED does not illuminate, then the media is broken. This CAT-5 cable used in this test may be inserted into an operating hub since the OmniHawk™ will not assert phantom current during the test mode (and consequently will not enter the network).

## INSTALLATION TEST

The OmniHawk™ tests for proper installation and lights the power / error LED red if a wrong connection is made. This check will only be made when the connecting devices are stations and/or active hubs. Among active devices, there are **initiators** and **echoers**. An initiator is a device that either sends phantom current or the fiber optic insertion key. An echoer is a device that receives phantom current or the fiber optic insertion key.

The OmniHawk™ installation test feature warns the installer that an initiator has been connected to both the fiber optic interface and to the copper interface. Since it doesn't make sense to connect two ring out (RO) trunk lines together, the power / error LED warns of this condition by lighting red.

## RUN-TIME ACTIVITY & ERROR MONITORING

During normal operation the fiber optic and copper ready LEDs provide continuous diagnostic information. These LEDs detect and display token ring activity.

The insert status LED informs the user of the insert status of the fiber optic and copper media. This LED lights green when both the active signaling fiber optic and copper devices have successfully reached insertion.

The insert status LED flashes when the OmniHawk™ has received phantom current on its copper side but has not yet achieved insertion on its fiber optic side, or conversely, when the unit has received the fiber optic key on its fiber side but has not yet sensed a phantom current echoer on its copper side.

When the OmniHawk™ connects to passive devices, the insert status LED will always be off.

## UNPACKING

- a. Visual Inspection - before unpacking, a visual inspection should be conducted in order to detect any physical damage to the equipment. Any evidence of damage should be noted and reported immediately.
- b. Unpacking - place shipping container on a flat surface, cut straps or tape, open top. Take out each item carefully and place securely on a clean flat surface. Return all packing material into container (foam, boxes etc.), close and store away for future re-use.
- c. Inspection - Inspect each item for any apparent damage, any evidence of damage should be noted and reported immediately.
- d. Content - Review the content; the following items should be included:
  - OmniHawk™ module (1)
  - power supply module
  - User's Manual (the document you are now reading)

Please note any missing items or discrepancies and report them immediately.

## SITE REQUIREMENTS

A power outlet should be available within 5 ft. of the unit. The following power supply modules are required for the following power outlets:

MODEL	POWER OUTLET
3900	110 Volt - 60 Hz
3900-2	220 Volt - 50 Hz
3910	110 Volt - 60 Hz
3910-2	220 Volt - 50 Hz

## NORMAL CONFIGURATION

- a. Attach the workstation or hub with the appropriate cable to the OmniHawk™.
- b. Plug the external power supply into the appropriate AC wall outlet.
- c. Plug the power jack into the OmniHawk™ power connector.
- f. The LEDs will flash during their self test, then settle according to the current connection status.

Refer to the APPLICATIONS section for useful application information.

## ALTERNATE POWER SOURCE

Some Token Ring network interface cards supply power via the DB-9 connector. Compatible network interface cards supply +5V on pin 3 and ground on pins 2, 4, 7, and 8. When power from the network interface card is available, the OmniHawk™ will use that power and the external power supply may be disconnected.

## INSTALLATION TEST CONFIGURATIONS

The OmniHawk™ supports the following media test configuration.

### Loopback Media Test

To test the integrity of fiber optic media connect the fiber optic patch cable in a loopback fashion (i.e., one end in the transmit port and the other in the receive port). If the fiber is unbroken, the OmniHawk™ fiber ready LED will illuminate green. If the fiber is partially or completely broken, the LED will be off.